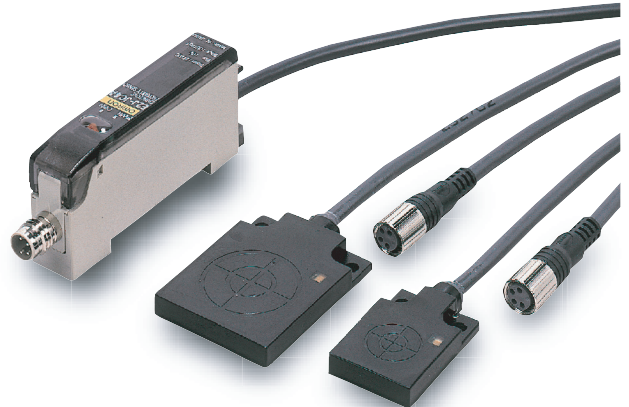


# Long Sensing-distance Capacitive Separate Amplifier Proximity Sensor E2J

## Compact and Ideal for Robot Hands. Especially Effective in Detecting LCDs, Wafers, and PDPs.\*

- Flat head is only 5.5-mm thick.
- Robotics cable ensures improved flexibility.
- Operation indicator on the Sensor Head.
- Easy-to-use connector.






\* Plasma Display Panel (for wall-mounted TVs)

Be sure to read *Safety Precautions* on page 972.

### Ordering Information

#### Sensors

##### Sensor Heads


Appearance	Sensing distance (variable)	Model
 Flat, Unshielded	 10 mm (4 to 10 mm)	<b>E2J-W10MA</b>
	 20 mm (8 to 20 mm)	<b>E2J-W20MA</b>

##### Amplifier Units

Output configuration	Model
DC 3-Wire NPN Open-collector output	<b>E2J-JC4A</b>

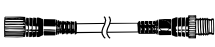
#### Accessories (Order Separately)

##### Dust Covers

Appearance	Application	Application	Model
	Dust protection *	E2J-JC4A Amplifier Unit	<b>XS3Z-13</b>
		E2J-W□MA Sensor	<b>XS3Z-15</b>

\* These dust covers are for protection against dust. They do not satisfy IP67. When attaching the Dust Cover, be sure to fully insert the connector into the Dust Cover.

##### Sensor I/O Connectors with Cables

Appearance	Application	Cable conductors	Cable length	Model	Remarks
	For cable extension	4 conductors	1 m	<b>XS3W-M421-401-R</b>	M8-screw-mounting cables Robotics cables (vibration resistant) Straight/Straight Model
			2 m	<b>XS3W-M421-402-R</b>	

Note: Refer to *Introduction to Sensor I/O Connectors* on page 1312 for details.

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## Ratings and Specifications

### Sensor Heads

Item	Model	E2J-W10MA	E2J-W20MA
Sensing distance		10 mm	20 mm
Sensing area		4 to 10 mm	8 to 20 mm
Differential travel		15% max. of sensing distance	
Sensing object		Conductors and dielectrics	
Standard sensing object		Grounded metal plate: 50 × 50 × 1 mm	
Response frequency		70 Hz min.	
Indicators		Detection indicator (red)	
Ambient temperature		Operating/Storage: -10 to 55°C (with no icing or condensation)	
Ambient humidity		Operating/Storage: 35% to 95% (with no condensation)	
Vibration resistance		Destruction: 10 to 500 Hz, 2-mm double amplitude or 150 m/s <sup>2</sup> for 2 hours each in X, Y, and Z directions	
Shock resistance		Destruction: 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions	
Degree of protection		IP66 (IEC)	
Connection method		Pre-wired Connector Models (Robotics cable, Standard cable length: 1 m)	
Weight (packed state)		Approx. 30 g	Approx. 40 g
Materials	Case	Heat-resistant ABS	

### Amplifier Units

Item	Model	E2J-JC4A
Power supply voltage		24 VDC ±20%, ripple (p-p): 10% max.
Current consumption		30 mA max.
Control output	Load current	NPN open-collector output, 100 mA max. (30 VDC max.)
	Residual voltage	1 V max.
Indicators		Operation indicator (orange) Power indicator (green)
Number of turns of sensitivity adjustment		8 turns with an indicator
Protection circuits		Load short-circuit protection, Surge suppressor, Reverse polarity protection
Ambient temperature		Operating/Storage: -10 to 55°C (with no icing or condensation)
Ambient humidity		Operating/Storage: 35% to 85% (with no condensation)
Temperature influence (Sensor with Amplifier)		±25% max. of sensing distance at 23°C in the temperature range of 0 to 40°C
Voltage influence		±1% max. of sensing distance at the rated voltage in the ±20% rated voltage range
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case
Vibration resistance		Destruction: 10 to 150 Hz, 1.5-mm double amplitude or 100 m/s <sup>2</sup> for 2 hours each in X, Y, and Z directions
Shock resistance		Destruction: 300 m/s <sup>2</sup> 3 times each in X, Y, and Z directions
Degree of protection		IP50 (IEC)
Connection method		Pre-wired Models (Standard cable length: 2 m)
Weight (packed state)		Approx. 60 g
Materials	Case	ABS
Accessories		Mounting Bracket, Instruction manual

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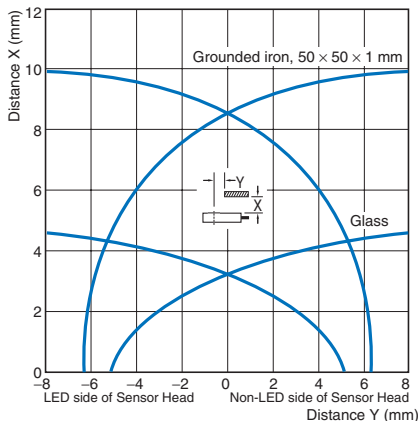
E2J

# E2J

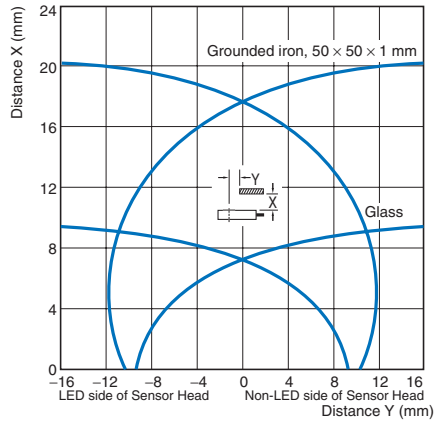
## Engineering Data (Typical)

### Sensing Area

**E2J-W10MA**

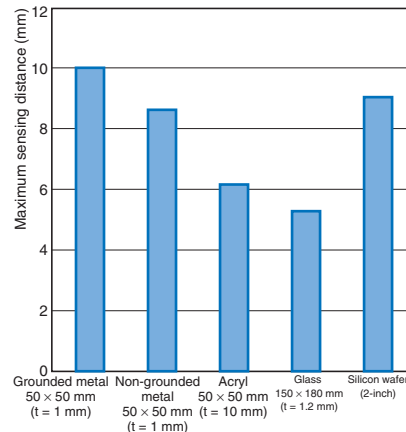


**E2J-W20MA**

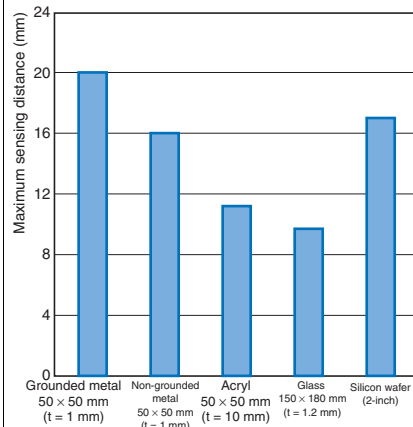


### Sensing Distance Change by Sensing Object (Typical)

**E2J-W10MA**

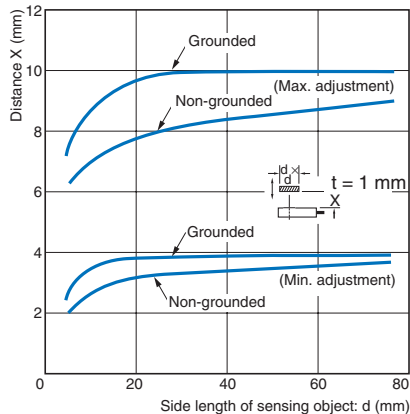


**E2J-W20MA**

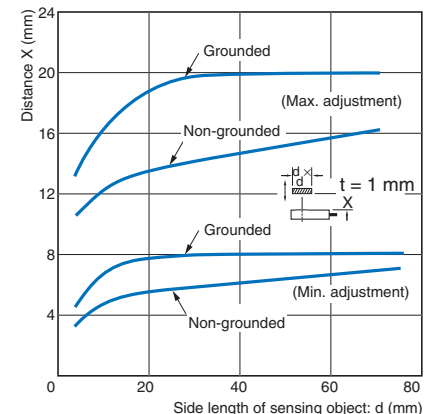


### Influence of Sensing Object (Iron)

**E2J-W10MA**

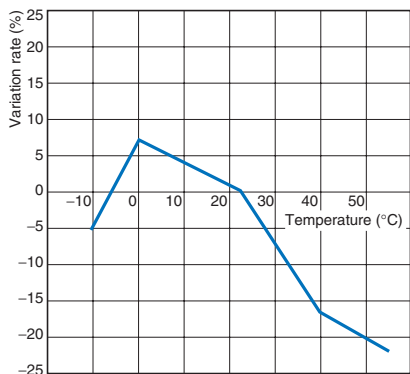


**E2J-W20MA**

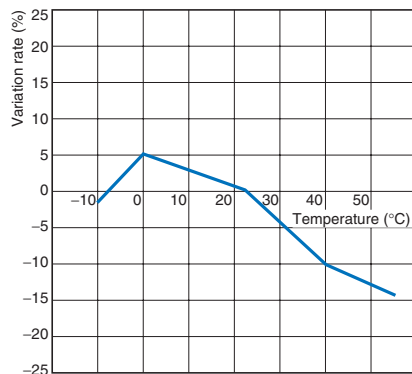


### Influence of Ambient Temperature

**E2J-W10MA**



**E2J-W20MA**



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## I/O Circuit Diagrams

Operation mode	Model	Timing chart	Output circuit
NO	E2J-W10MA E2J-W20MA + E2J-JC4A	Sensing object Present Not present Output transistor ON OFF Sensor detection indicator (red) ON OFF Amplifier Unit operation indicator (orange) ON OFF	
		Sensing object Present Not present Output transistor ON OFF Sensor detection indicator (red) ON OFF Amplifier Unit operation indicator (orange) ON OFF	

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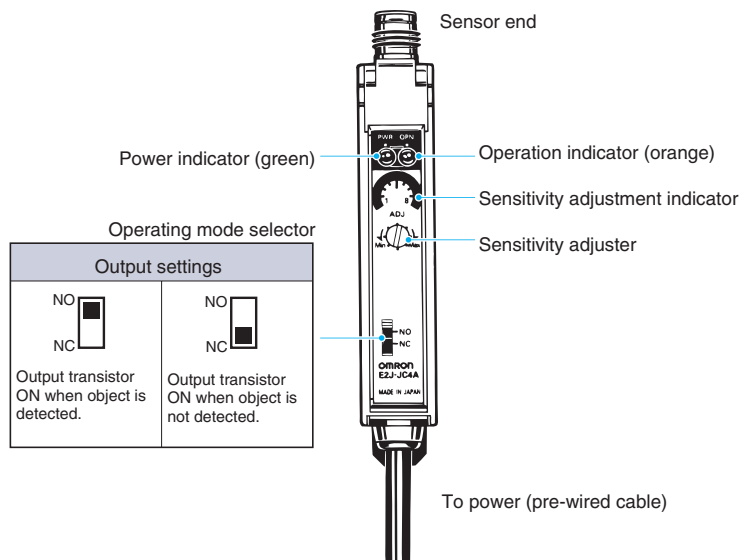
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## Amplifier Unit Nomenclature



E2K-C

E2K-X

E2K-F

E2K-L

E2KQ-X

E2J

# E2J

## Safety Precautions

Refer to *Warranty and Limitations of Liability* on page F-2.

### ⚠ WARNING

This product is not designed or rated for ensuring safety of persons. Do not use it for such purposes.



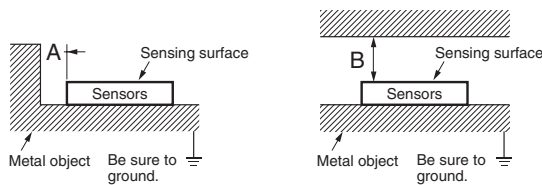
### Precautions for Correct Use

Do not use this product under ambient conditions that exceed the ratings.

#### ● Design

##### Influence of Surrounding Metal

When mounting the Sensor with a metal panel, ensure that the clearances given in the following table are maintained. Failure to maintain these distances may cause deterioration in the performance of the Sensor.

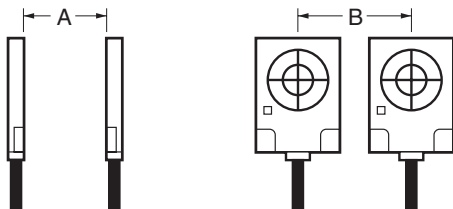


**Influence of Surrounding Metal** (Unit: mm)

Model	Dimension	A	B
E2J-W10MA		10	20
E2J-W20MA		20	40

##### Mutual Interference

When installing Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.



**Mutual Interference** (Unit: mm)

Model	Dimension	A	B
E2J-W10MA		20	30
E2J-W20MA		70	50

#### ● Mounting

##### Handling

- Do not use the Sensor outdoors.
- Do not wire the Sensor alongside a high-tension or power line.
- Do not use portable telephones or transceivers near the Sensor. Be sure to ground the Mounting Brackets.
- Do not use the Sensor in an environment where it will be exposed to chemicals, particularly chemical solutions or oxidizing acids.

##### Influence of Static Electricity

Be sure to discharge static electricity before detecting objects that are greatly affected by static electricity.

##### Mounting the Sensor

The maximum tightening torque that should be applied is 0.54 N·m.

##### Cable between Sensor and Amplifier Unit

- Be sure that the bending radius of the cable is more than 5 mm.
  - Use the XS3W-M421-40□-R cable with connectors (M8-screw mounting) as the extension cable.
- The maximum cable length is 3 m (extension section: 2 m).

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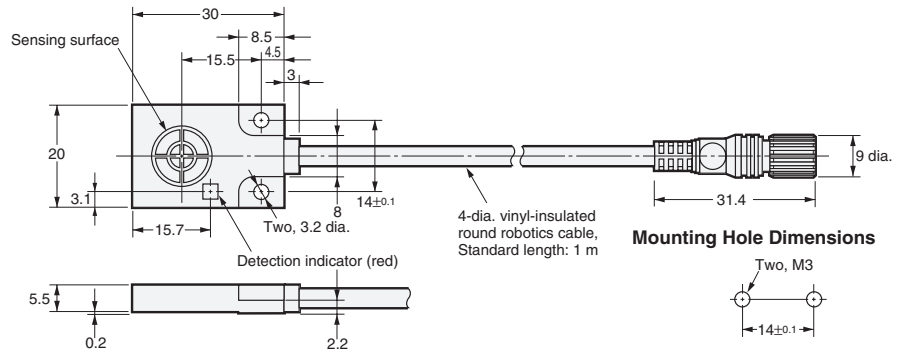
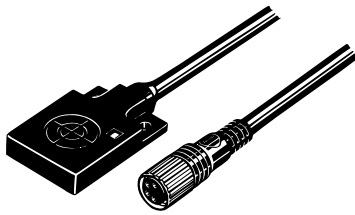
E2KQ-X

E2J

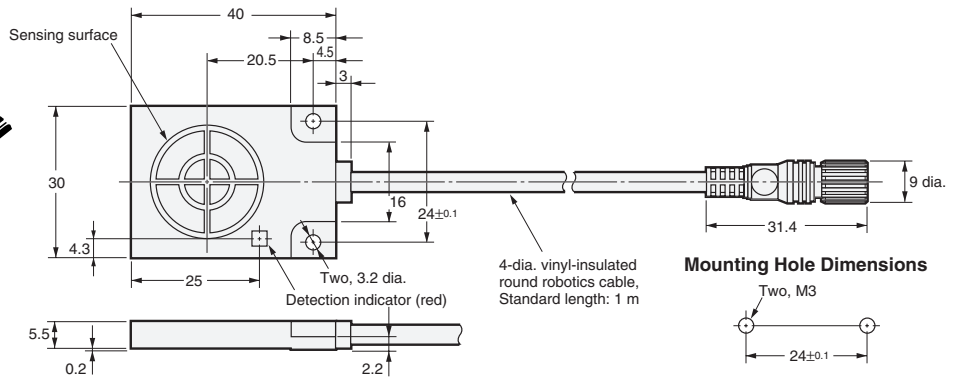
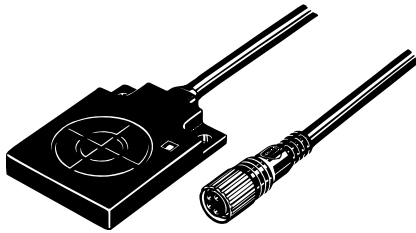
Dimensions

Sensors  
Sensor Heads

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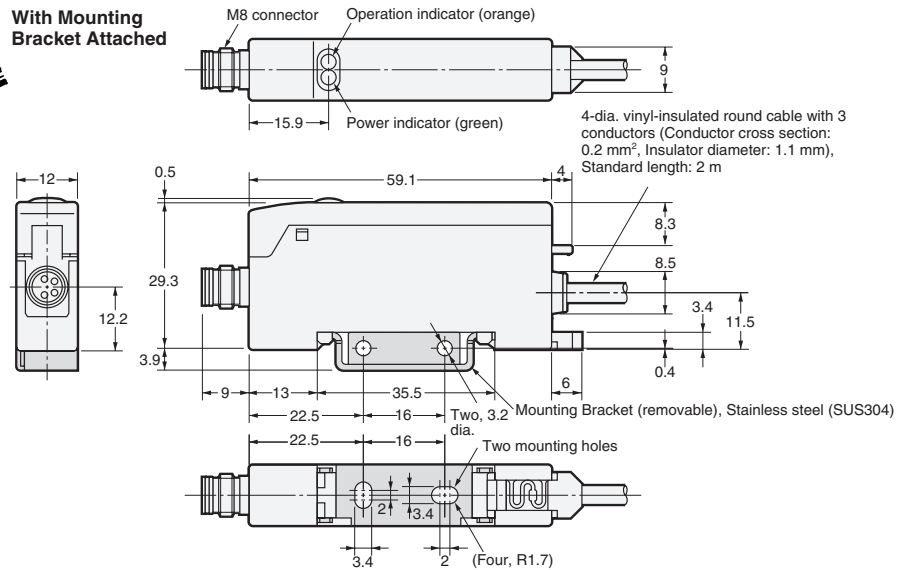
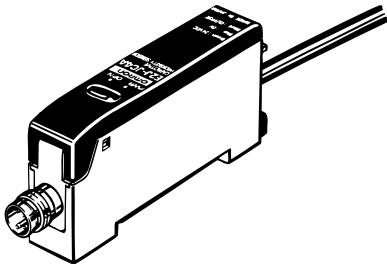


E2J-W20MA



Amplifier Units

E2J-JC4A



Accessories (Order Separately)

Dust Cover Material: polyvinyl chloride (red)

XS3Z-13 (for E2J-JC4A Amplifier Unit)

XS3Z-15 (for E2J-W□MA Sensor)

